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[54] **LASER DELIVERY SYSTEM**

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[52] **U.S. Cl.** **606/7**; 606/14; 606/15

[58] **Field of Search** 606/2, 7, 10–16; 128/395–398

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[57] **ABSTRACT**

A system is described for the delivery of light to, and/or the receiving of light from, a target located on the wall of a tortuous tube such as a blood vessel. The delivery system is generally useful for laterally delivering and receiving light for the detection and photodynamic therapy of target tissue and is particularly useful for the treatment of atherosclerosis. When certain biocompatible photoreactive molecules such as hematoporphyrin or the like are injected into a patient the molecules are selectively taken up by target tissue such as tumors or atheromatous plaque. Subsequent illumination of the target tissue activates the photoreactive molecules causing fluorescence emission from, and destruction of, the host target tissue. The preferred embodiments comprise a hollow optical waveguide terminating in a supple diffuser tip which may be inserted over an intravascular flexible guide wire. The optical delivery catheter is advanced along the guidewire until the diffuser tip reaches the target tissue. Light of a wavelength suitable to activate previously injected photoreactive molecules is delivered to the target causing selective cell lysis and/or target tissue destruction. The disclosed system is also capable of delivering laser energy for simultaneous hyperthermic generation and photodynamic therapy.

15 Claims, 3 Drawing Sheets